

REMARKS

In view of the above amendments and following remarks, reconsideration of the rejections contained in the Office Action of July 3, 2007 is respectfully requested.

It is initially noted that a number of minor editorial changes have been made to the specification for the sake of form.

Further, claims 1-30 have been canceled and replaced with new claims 31-34. Independent claim 31 is the only independent claim, and represents, substantively, a combination of the limitations of prior claims 1, 21 and 26.

Prior dependent claim 26 discusses the fact that the waste liquid regeneration apparatus comprises a waste liquid supplying apparatus for supplying the waste liquid to the first chamber. The waste liquid supplying apparatus has an intermittent supplying mode in which mode the waste liquid is alternately supplied and stopped from being supplied to the first chamber.

This aspect of the present invention is discussed and described with respect to Figs. 26-28, for example. A waste liquid supplying apparatus 340 supplies the waste liquid to the regeneration tank 180. As discussed and described with respect to Figs. 27 and 28, where an equal amount of waste liquid 111 is processed, the concentration of ink pigment that is contained in the regenerated cleaning liquid 162 can be suppressed to a lower degree with an intermittent supplying mode than with a continuous supplying mode. Note the discussion beginning at line 22 of page 78 of the original English-language text.

As noted above, this aspect is now reflected in independent claim 31. It is not disclosed in the references cited by the Examiner.

In rejecting claim 26, the Examiner combined JP 2002-079259 with JP 2001-315312. This rejection begins in section 5 on page 10 of the Office Action. The Examiner acknowledged that the waste liquid regeneration apparatus of the primary reference JP 2002-079259 did not disclose a waste liquid supplying apparatus for supplying the waste liquid to the first chamber or an intermittent supplying mode. However, the Examiner referred to JP 2001-315312 as teaching a waste liquid supplying apparatus configured to allow operation in accordance with an intermittent supplying

method in which supply of the waste liquid and stopping of the supply were performed alternately. Reference was made to a machine translation paragraphs 18 and 23.

It is noted that the machine translation of this document is not of record. However, it has been obtained, and a copy is attached hereto.

As discussed in paragraph 18, the waste fluid regenerative apparatus for this document is divided into a collection tank and a storage tank. The collection tank 6 has a small capacity and recovers the ink pigment from the waste fluid. This paragraph does discuss a time interval of washing, but it is submitted that this refers to washing of a blanket drum of a printing machine. There does not appear to be any reference to intermittent supply of a waste liquid to any first chamber as defined by claim 31.

Paragraph 23 discusses the advantages of the arrangement of this document in a similar manner to paragraph 18. There is in fact no disclosure of an intermittent supply mode of a waste liquid supplying apparatus that supplies waste liquid to a first chamber.


Accordingly, none of the documents cited by the Examiner properly disclose this feature. Nor do the documents provide any reason to modify the references to include such a feature.

Accordingly, it is respectfully submitted that the present as now defined by independent claim 31 clearly patentably distinguishes over the prior art cited by the Examiner. Indication of such is respectfully requested.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance, and the Examiner is requested to pass the case to issue. If the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact Applicants' undersigned representative.

Respectfully submitted,

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- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the regenerative apparatus of the waste fluid which comes out at the time of washing of the blanket drum of a printing machine, or an impression cylinder. Furthermore, it is related with the waste fluid regenerative apparatus which collects the electrified ink pigments efficiently in detail for a short time.

[0002]

[Description of the Prior Art] In the former, in order to discard the waste fluid which comes out at the time of washing of the blanket drum of a printing machine, or an impression cylinder as it is, abandonment costs, such as waste fluid processing, had started from the environmental problem. Moreover, although a blanket drum etc. is washed, since a lot of penetrant removers were used, there was a problem that a running cost increased. Then, waste fluid was recently reworked and the attempt in which a penetrant remover would be reused also came out. The example is called sedimentation method and shows the outline of the waste fluid rework equipment used for the sedimentation method at drawing 4.

[0003] As shown in drawing, conventional waste fluid rework equipment 1 formed the container 2 which collects the washing waste fluid 16, connected the pars-basilaris-ossis-occipitalis discharge piping 24 to the pars basilaris ossis occipitalis of a container 2, and has connected the flank discharge piping 25 to the side attachment wall of a container 2. The container 26 for concentration waste fluid recycling is arranged in the outlet of the pars-basilaris-ossis-occipitalis discharge piping 24 among these piping 24 and 25, and the container 27 for playback penetrant remover recycling is arranged in the outlet of the flank discharge piping 25. Moreover, the closing motion bulb 14 is connected to the path of one pars-basilaris-ossis-occipitalis discharge piping 24, the closing motion bulb 15 is connected to the upstream at the path of the flank discharge piping 25 of another side, and the filter 12 is arranged in the downstream.

[0004] By such configuration, waste fluid rework equipment 1 accumulates the waste fluid 16 after washing the roller of a printing machine in a container 2, and makes the ink pigment 18 sediment at the pars basilaris ossis occipitalis of a container 2 by adding the drugs which promote sedimentation of the ink pigment 18 in waste fluid 16. The playback penetrant removers 20 from which the ink pigment 18 was removed are collected in the container 27 for playback penetrant remover recycling by collecting the precipitate ink pigments 19, i.e., concentration waste fluid, which sedimented from the pars-basilaris-ossis-occipitalis discharge piping 24 in the concentration waste fluid recovery solution 26, and filtering the supernatant of waste fluid 16 with a filter 12 from the flank discharge piping 25. In this way, the obtained playback penetrant remover 20 is reused. However, the purity of the rework penetrant remover 20 was low, this approach of sedimentation of the ink pigment 18 was insufficient, and since the filter 12 carried out blinding immediately depending on the combination of ink and a penetrant remover, there was a problem of performing exchange or cleaning of a filter 12 frequently.

[0005] Then, the attempt in which electric-field impression will recover an ink pigment by electrophoresis using the ink pigment being charged using equipment as shown in drawing 5 also occurs (Japanese Patent Application No. 11-297540). The waste fluid regenerative apparatus 1 of this printing machine is arranging in the interior of a container 2 the metal roller 3 installed in the ground side of a high voltage power supply. this metal roller 3 -- a lower half is countered mostly and predetermined spacing partition ***** 4 is arranged. It is immersed in waste fluid 16 by this fixed electrode 4 to extent in which that upper limit hides. Moreover, the pressure welding of the blade 5 is carried out to the metal roller 3, it connects with a blade 5 and the container 6 for ink pigment recycling is arranged. Here, the metal roller 3 is a product made from stainless steel, and manufactured the fixed electrode 4 with the copper plate. Moreover, the blade 5 was also grounded using the thing made from stainless steel.

[0006] Waste fluid playback is as the following procedure. The metal roller 3 is grounded, and where the forward high voltage is impressed to a fixed electrode 4, the metal roller 3 is rotated. If the forward high voltage is impressed to a fixed electrode 4, a penetrant remover and water 17 dissociate first by the electric field between the metal rollers 3, and subsequently, the ink pigment 18 will carry out electrophoresis and will adhere to the metal roller 3. Since it runs in the direction of the circumference of an anti-clock in drawing 5, after the metal roller 3 comes out of waste fluid 16, the ink pigment 18 adhering to the metal roller 3 is scratched with a blade 5, and is paid to it by the container 6 for ink pigment recycling. On the other hand, water 17 collected on the bottom of a container 2 is periodically removed by the scupper bulb 10.

[0007]

[Problem(s) to be Solved by the Invention] However, since washing is usually performed with the period of 30 minutes and waste fluid flows into a regenerative apparatus in the washing system of an actual printing machine, it is necessary to remove an ink pigment for a short time. Moreover, in order to reuse the reproduced penetrant remover, it is necessary to make [which had allowances to some extent] regenerative-apparatus capacity big but, and if equipment capacity becomes large, it takes time ...

amount that an ink pigment is spread to an electric-field impression field, reproduction speed falls, a roller and an electrode will become large and the problem that equipment cost also increases will come out. This invention was not made in view of the above-mentioned technical problem, and aims at offering the waste fluid regeneration equipment of the printing machine which equipment does not enlarge.

[0008]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, this invention divided into the storage tank which accumulates the penetrant remover which reproduced the container of a waste fluid regenerative apparatus with the collection tank which collects ink pigments, and has prepared the filter which does not let an ink pigment pass but lets only a penetrant remover pass among both tubs. Moreover, this invention is divided into the storage tank which accumulates the penetrant remover which reproduced the container of a waste fluid regenerative apparatus with the collection tank which collects ink pigments, prepares the opening electrode which has much openings among both tubs, impresses an electrophoresis **** electrical potential difference to a collection tank side for the ink pigment charged in the above-mentioned opening electrode, and confines an ink pigment in a collection tank, and he is trying only for a penetrant remover to make it flow into a storage tank. In addition, as for this invention, it is possible for the above-mentioned opening electrode to also make it unite with the fixed electrode for ink pigment recovery of a collection tank.

[0009]

[Embodiment of the Invention] Hereafter, the waste fluid regenerative apparatus of the printing machine by the gestalt of operation of this invention is explained, referring to drawing 1. The configuration of the waste fluid regenerative apparatus of this invention is shown in drawing 1. The container 2 of the waste fluid regenerative apparatus 1 adjoins the collection tank 8 which collects ink pigments, and the storage tank 9 which accumulates the reproduced penetrant remover 20, and is divided, and the waste fluid 16 containing the ink pigment, the water, and the penetrant remover which washed the printing machine and were discharged is constituted so that a collection tank 8 may be supplied. The filter 12 which a container 2 establishes the bridge wall 13 which is made to install between both the tubs 8 and 9 in a longitudinal direction side by side, and divides it, and does not let the ink pigment 18 pass to this bridge wall 13, but lets only a penetrant remover 20 pass is formed. Although the filter 12 is formed in a part of bridge wall 13 bottom, it can arrange a filter 12 in the bridge wall 13 of height with which the water of the pars basilaris ossis occipitalis of a collection tank 8 does not flow into a storage tank 9 side.

[0010] in the collection tank 8, the grounded metal roller 3 and its fixed electrode 4 of a semicircle arc type cross section which countered the lower half mostly and was formed with predetermined spacing partition ** and sheet metal are arranged. The metal roller 3 can be counterclockwise rotated by the driving means which is not illustrated. With the gestalt of this operation, spacing of the metal roller 3 and a fixed electrode 4 is set as 10mm, and it is immersed in waste fluid 16 by the fixed electrode 4 to extent in which the upper limit hides. A high voltage power supply 7 is arranged out of a container 2, + (forward) side is connected to a fixed electrode 4, and - (negative) side is connected to the metal roller 3.

[0011] Moreover, the blade 5 is pressed against the peripheral face of the metal roller 3 of a circular cross section, the location of a blade 5 is made to be arranged on the oil level of waste fluid 16, is connected with a blade 5, and, similarly the container 6 for ink pigment recycling is arranged on the oil level of waste fluid 16. Moreover, the scupper bulb 10 which can be opened and closed freely is formed in the pars-basilaris-ossis-occipitalis side face or pars basilaris ossis occipitalis of a collection tank 8. In the gestalt of this operation, the metal roller 3 and the fixed electrode 4 were manufactured by stainless steel. Moreover, the blade 5 used the thing made of a plastic.

[0012] The following procedure performs playback of the penetrant remover 20 in the waste fluid regenerative apparatus 1. The metal roller 3 is grounded, and where the forward high voltage is impressed to a fixed electrode 4, the metal roller 3 is rotated. Here, the applied voltage to a fixed electrode 4 was set as +10kV by the high voltage power supply 7. It has found out the ink pigment 18 just being charged and carrying out electrophoresis in a solution by original research of an artificer. Moreover, if the high voltage is impressed, it dissociated for a short time, and since the water 17 contained in waste fluid 16 has specific gravity larger than a penetrant remover, it has also found out the phenomenon which sinks to the bottom of a container 2. Therefore, if the forward high voltage is impressed to a fixed electrode 4, waste fluid 16 and water 17 dissociate first by the electric field between the metal rollers 3, and subsequently, the ink pigment 18 will carry out electrophoresis and will adhere to the metal roller 3. Since the metal roller 3 rotates in the direction of the circumference of an anti-clock in drawing 1, after the ink pigment 18 adhering to the metal roller 3 comes out of waste fluid 16, it is scratched with a blade 5 and it is paid to it by the container 6 for ink pigment recycling. On the other hand, water 17 collected on the bottom of a container 2 is periodically removed by the scupper bulb 10.

[0013] On the other hand among both the tubs 8 and 9, the filter 12 which does not let the ink pigment 18 pass but lets only a penetrant remover pass is formed, and the playback penetrant remover 20 which does not contain an ink pigment is accumulated in the storage tank 9. Durable qualitative-filter-paper GS-25 made from a glass fiber (made in ADVANTEC East) was used for the filter 12. Only a filter 12 can also separate without performing ink pigment recovery by the collection tank 8, but since it is checking in the experiment that a filter 12 carries out blinding in an ultrashort period, the collection tank 8 has been formed. Moreover, since it grasped in the experiment that a filter 12 carried out blinding easily also in this case when waste fluid was put into the collection tank 8 in the condition that nothing can go into a storage tank 9, it decided to put a fresh penetrant remover into a storage tank 9 first. Thus, after the waste fluid 16 which came out of the washing station going into the collection tank 8 of this waste fluid regenerative apparatus first and removing an ink pigment there, the penetrant remover which does not contain the ink pigment 18 moves it to a storage tank 9 gradually through a filter 12. In case the penetrant remover 20 stored in the storage tank 9 washes a blanket and an impression cylinder, it is supplied and reused by the washing system with a pump.

[0014] The result of having examined using the [example 1], next this waste fluid regenerative apparatus is explained. About the waste fluid regenerative apparatus, the above-mentioned waste fluid regenerative apparatus 1 was used.

(Waste fluid regenerative apparatus)

Applied voltage between the clearance: 10mm fixed electrode 4 which it is with a fixed electrode 4 and the metal roller 3, and the metal roller 3: Five kinds of following ink of sheet ink was used for +10kV (ink) ink.

** Yes, echo MZ(Toyo Ink make) ** Geos-GN(Dainippon Ink make) ** super tech plus H(product made from T&K) ** diamond tone M(SAKATA INX CORP. make) ** SERUBO Y(Tokyo Printing Ink Mfg. Co., Ltd. make) [0015] (Penetrant remover) Five kinds of following penetrant removers were used for the penetrant remover.

** a die -- clean (Dainippon Ink make) ** auto clean (Nikken Chemicals Co., Ltd. make) ** BURAKURIN S(product made from Knickerbockers) ** print cleaner (Toyo Ink make) ** super -- clean (product made from Ink Tech) -- the solution which mixed equally the ink of four colors of indigo blue, red, yellow, and Japanese ink, and was diluted with the penetrant remover to 1% about 25 kinds which combined these -- 20 more% of water -- in addition, it experimented by making simulation waste fluid. [0016] Ink consequently, Geos-GN (Dainippon Ink make) and SERUBOY (Tokyo Printing Ink Mfg. Co., Ltd. make), and a penetrant remover In clean (Nikken Chemicals Co., Ltd. make) and six kinds of simulation waste fluid which combined BURAKURINS (product made from Knickerbockers), and a print cleaner (Toyo Ink make), the adhesion force to the metal roller 3 of the ink pigment 18 is weak a little. auto -- Although the inclination for the adhesion ink pigment 18 to tend to be omitted was seen, it sets about all combination. It checked that separation recovery of the ink pigment 18 and water 17 could be performed according to separation of water 17, adhesion on the metal roller 3 of the ink pigment 18, rotation of the metal roller 3, and many processes of scraping with a blade 5 after electrical-potential-difference printing pressure.

[0017] In the usual printing machine, the water for removing the penetrant remover of a petroleum solvent for the blanket drum and impression cylinder of a printing machine to remove an ink pigment, whenever a series of printings are completed, and paper powder needs to wash, and it is not avoided that conductive water mixes waste fluid out of an ink component and an insulating penetrant remover. Although it was thought that electrophoresis of the charged particle in a conductive liquid was not efficiently carried out from general common sense, when electric field were impressed, an insulating penetrant remover and conductive water dissociated, and it found out that an ink pigment was unevenly distributed in a penetrant remover. Moreover, that the ink pigment is charged is the phenomenon which the artificer discovered uniquely, since it generally is not known, there is that no such an attempt was made in the past, and the peculiarity of this invention is based on such an artificer's original new discovery phenomenon.

[0018] Since according to the gestalt of this operation a waste fluid regenerative apparatus is divided into a collection tank and a storage tank and the collection tank of small capacity recovers an ink pigment from deep waste fluid, efficient and high-speed recovery are attained, and equipment becomes compact, and equipment cost can also be reduced. Furthermore, since there is an always reproduced pure penetrant remover in a storage tank, even if it changes the time interval of washing sharply, a penetrant remover can be used at any time, and the flexibility of equipment improves. Moreover, it is not necessary to exchange filters frequently like a sedimentation method, and since a component is automatically separated only by impressing an electrical potential difference, a maintenance also becomes easy.

[0019] Next, it explains, referring to drawing 2 about the gestalt of operation of the 2nd of this invention. The configuration of the waste fluid regenerative apparatus of this invention is shown in drawing 2. the metal roller 3 which the container 2 of a waste fluid regenerative apparatus is divided into the collection tank 8 which collects ink pigments, and the storage tank 9 which accumulates the reproduced penetrant remover 20 with the bridge wall 13, and was grounded in the collection tank 8 -- the -- a lower half is countered mostly and the predetermined spacing partition **** fixed electrode 4 is arranged. Some fixed electrodes 4, i.e., the bridge wall 13 side-edge section, are the opening electrodes 11 which have much openings, and the part serves as a bridge wall of a collection tank 8 and a storage tank 9. Therefore, the opening electrode 11 has divided the collection tank 8 and the storage tank 9 as some bridge walls 13. When a forward electrical potential difference is impressed to the opening electrode 11, it is pushed aside by the just charged ink pigment in the direction of a metal roller, and it can be prevented from flowing into the direction of a storage tank 9. In this experiment, it united with the opening electrode 11 with the fixed electrode 4 using the punching wire gauze and the mesh-like wire gauze, and spacing with the metal roller 3 was set as 10mm.

[0020] Although the magnitude of opening of the opening electrode 11 was changed variously and the transparency stopping power of an ink pigment was evaluated at this time, it turned out that the amount of the ink pigment with which it rubs against 1/10 of about 1mm of inter-electrode distance, and ** flows into a storage tank 9 side can be made sufficiently small. However, if inter-electrode distance is made small, it will be thought that it is necessary to also make magnitude of opening small. Although it is also possible to make it larger than 1mm if distribution of the equipotential surface is considered when inter-electrode distance is large, considering the effect of a flow of liquid etc., enlarging recklessly is not desirable. Probably, for preventing certainly the inflow of the ink pigment to a storage tank 9, 1mm or less extent will be desirable.

[0021] The recovery process of an ink pigment is completely the same as the gestalt of implementation of the above 1st. Moreover, although experimented in waste fluid playback in the combination of various ink and a penetrant remover as well as the gestalt of the above-mentioned implementation, the recovery property was good as well as the gestalt of implementation of the above 1st. Thus, after the waste fluid 16 which came out of the washing station going into the collection tank 8 of this waste fluid regenerative apparatus first and removing the ink pigment 18 there, the penetrant remover which does not contain an ink pigment moves it to a storage tank 9 through the opening electrode 11. In case the penetrant remover 20 stored in the storage tank 9 washes a blanket and an impression cylinder, it is supplied and reused by the washing system with a pump.

[0022] Next, it explains, referring to drawing 3 about the gestalt of operation of the 3rd of this invention. With the gestalt of this operation, the opening electrode 11 as a bridge wall which divides these into a longitudinal direction was separately formed between the collection tank 8 and the storage tank 9, and the forward side of high voltage power supply 7a is connected to the opening electrode 11. With the gestalt of this operation, although the opening electrode 11 is arranged in the whole bridge wall,

you may arrange partially, without not necessarily arranging the opening electrode 11 in the whole. The electrical potential difference of high voltage power supply 7a is made larger than the applied voltage of one high voltage power supply 7. thereby, electrophoresis of the ink pigment is carried out to the direction of a collection tank 8 -- it can carry out. About the configuration of the metal roller 3 or fixed electrode 4 grade, it is the same as the 1st example in other configurations. As a result of impressing the electrical potential difference of +15kV to the opening electrode 11 and conducting a verification experiment by the configuration of this waste fluid rework equipment 1, as well as the case of the above-mentioned example 2, the ink pigments 18 could be collected and, moreover, did not almost have diffusion of the ink pigment 18 to a storage tank 9. However, probably, the direction of the gestalt of implementation of the above 2nd is excellent in this equipment configuration from the point of the simplicity of cost and an equipment configuration, since high-voltage power-source of one more piece 7a is needed out of the high voltage power supply 7 for fixed electrode 4.

[0023] Since according to this invention a waste fluid regenerative apparatus is divided into a collection tank and a storage tank and the collection tank of small capacity recovers an ink pigment from deep waste fluid, efficient and high-speed recovery are attained, and equipment becomes compact, and equipment cost can also be reduced. Furthermore, since there is an always reproduced pure penetrant remover in a storage tank, even if it changes the time interval of washing sharply, a penetrant remover can be used at any time, and the flexibility of equipment improves. Moreover, since the filter 12 is not used like the gestalt of implementation of the above 1st, there are no worries about the blinding of a filter and a maintenance also becomes easy.

[0024] As mentioned above, of course based on the technical thought of this invention, various deformation is possible for this invention, although the gestalt of operation of this invention was explained, without being limited to this. For example, although the opening electrode 11 and the filter 12 were separately formed with the gestalt of the above-mentioned implementation, it is also possible to use these collectively. That is, a filter 12 may be put side by side to the 11th page of an opening electrode, two bridge walls may be established, and the opening electrode 11 and a filter 12 may be arranged separately.

[0025]

[Effect of the Invention] Since the filter which divides into the storage tank which accumulates the penetrant remover which reproduced the ink pigment which washed the printing machine and was discharged, water, and the container which collects the waste fluid containing a penetrant remover with the collection tank which collects ink pigments according to this invention as stated above with a bridge wall, and does not let the above-mentioned ink pigment pass to this bridge wall, but lets a penetrant remover pass was prepared, the playback penetrant remover could be accumulated in the storage tank side. Moreover, the ink pigment, water which according to this invention washed the printing machine and were discharged, In the waste fluid regenerative apparatus which it has [regenerative apparatus] the container which collects the waste fluid containing a penetrant remover, and the electrode of a pair is prepared [regenerative apparatus] in this container, and makes the above-mentioned ink pigment adhere to one electrode by electrophoresis among these electrodes While a bridge wall divides the inside of the above-mentioned container into a collection tank and a storage tank and arranging the above-mentioned electrode in the above-mentioned collection tank By preparing the opening electrode in which opening which lets a penetrant remover pass to the above-mentioned bridge wall with 1 operation gestalt was formed, and impressing an electrical potential difference to this opening electrode Since an opposite direction is made to carry out electrophoresis of the ink pigment of the above-mentioned collection tank an opening electrode side and it was made to make the inflow of the ink pigment to the above-mentioned storage tank prevent, ink pigments are collected in a collection tank and a playback penetrant remover can be more effectively reproduced in a storage tank. Moreover, with other operation gestalten of this invention, since the electrode of another side was constituted as some above-mentioned opening electrodes among the electrodes of the above-mentioned pair, saving of the number of electrodes is attained.

[Translation done.]